TECHNICAL NOTES

NATURAL RESOURCES CONSERVATION SERVICE – WYOMING

AGRONOMY NO. 19 **February 23, 2009**

SUBJECT:

Nutrient Management and Comprehensive Nutrient Management Plan Components/Checklist

All Nutrient Management Plans must be reviewed and approved by a certified Nutrient Management Planner.

The Nutrient Management Plan is a single component of an overall conservation plan. All other Essential Practices and the associated supporting documentation/quality criteria should also be included in the case file.

Nutrient Management is just one of the components of a Comprehensive Nutrient Management Plan (CNMP) for Animal Feeding Operations (AFO) and permitted Confined Animal Feeding Operations (CAFO).

Nutrient Management Plans will include the following items and jobsheets, as applicable:

- NRCS Field Office Technical Guide (eFOTG), Section I, Table of Contents:
  - Agronomy Technical Notice 3-Nitrogen Fixation and Legume Inoculation
  - Agronomy Technical Notice 10-University of WY Guide to Fertilizer Recommendations B-1045 Extension Offices or online at University of Wyoming
  - Agronomy Technical Notice 11.7-Nutrient Management Design Form Instructions WY-ECS-44
  - Agronomy Technical Notice 12.2-Instructions for the WY-ECS-45a Waste Utilization Excel Worksheet
  - Agronomy Technical Notice 12.7-Liquid Waste Utilization WY-ECS-45b Instructions
  - Agronomy Technical Notice 13-Soil Testing and Fall/Snow Manure Application Guidelines
  - Agronomy Technical Notice 15-Phosphorus Index
  - Agronomy Technical Notice 25-Nitrogen Leaching Index
  - Agronomy Technical Notice 19-Nutrient Management and Comprehensive Nutrient Management Plan Components/Checklists
  - Agronomy Technical Notice 20-Liquid Waste Utilization Application Guidelines/Sizing Vegetated Areas
  - Agronomy Technical Notice 24-Ag Waste Available Water Holding Capacity Example
- NRCS (eFOTG), Section IV, Conservation Practices: 590 Nutrient Management, 633 Waste Utilization WY-ECS-44 Nutrient Management Work Sheet for Commercial Fertilizer and Manure Fertilizer and WY-ECS-58 Nutrient Management Planning Work Sheet and WY-ECS-60 AFO/CAFO Inventory Sheet WY-ECS-45a, Solid Waste Worksheet and/or WY-ECS-45b Liquid Waste Worksheet WY-ECS-86 Comprehensive Nutrient Management Plan (CNMP) Template
- NRCS (eFOTG), Section IV, Conservation Practices: 328 Conservation Crop Rotation, WY-ECS-62
- NRCS RUSLE2 program for predicting soil loss by water erosion and calculating soil quality index (SCI), WY-ECS-40B
- NRCS WEQ program for predicting soil loss by wind erosion, WY-ECS-40A

MANAGEMENT PLANS

Nutrient Mgmt Plan	Comprehensive Nutrient Management Plan
	BACKGROUND & SITE INFO: Detailed summary of operation, Owner/Operator Information, Facility Location, Type and Size of Operation, Natural Resource WY-ECS- 60 and WY- ECS- 86
	MANURE & WASTEWATER HANDLIING & STORAGE: Maps of Production Area, Biosecurity, Production Area Conservation Practices, Manure Storage, Animal Inventory, Mortality Management, Manure Exports, Imports, Internal Transfers of Manure
NUTRIENT MANAGEMENT: Crop rotation of crops and yields, Soil tests, Manure tests, Manure Application setback distances, Planned crops and fertilizer recommendations, Planned nutrient applications, manure inventory, fertilizer material summary, Farm nutrient balance of acres planned for nutrient application. WY-ECS-44 Nutrient Balance-Fertilizer WY-ECS- 45a Solid Waste, WY-ECS-45b Liquid Waste. Agronomy Note 15 and 25 if manure is applied.	FARMSTEAD SAFETY AND SECURITY: Emergency Response Plan, Biosecurity Measure, Catastrophic Mortality Management, Chemical Handing Check Sheet
	LAND TREATMENT CONSERVATION PRACTICES: Aerial maps of land application areas, fields delineated with setbacks, buffers, irrigation ditches, sensitive areas, property boundaries. Land treatment conservation practices: vegetated buffers, IWM
	SOIL EROSION, NITROGEN & PHOSHPHORUS RISK ASSESSMENTS: Soil maps, soils report information, predicted soil erosion, Nitrogen and Phosphorus Risk Assessment ratings
	NUTRIENT MANAGEMENT: Crop rotation of crops and yields, Soil tests, Manure tests, Manure Application setback distances, Planned crops and fertilizer recommendations, Planned nutrient applications, manure inventory, fertilizer material summary, Farm nutrient balance of acres planned for nutrient application WY-ECS-44 Nutrient Balance-Fertilizer, WY-ECS- 45a Solid Waste, WY-ECS-45b Liquid Waste. Agronomy Technical Note 15 and 25 if manure is applied.
	FEED MANAGEMENT: Not applicable in Wyoming as it is not a Feed Management conservation practice in Wyoming
	OTHER UTILIZATION OPTIONS: ie: composting
	RECORDKEEPING FORMS: Annual crop records, manure application records, results of soil and manure analysis, other commercial fertilizer records, irrigation water application records, Manure export off the farm, manure export onto to farm, internal transfers of manure, inspection/monitoring records of the facilities, other records required by Federal, State, local regulations.
	REFERENCES:

Comprehensive Nutrient Management Plans (CNMP) must be reviewed and signed by a NRCS Certified Nutrient Management and Land Treatment Specialist.
CNMP Manure and Wastewater Handling and Storage must be reviewed and signed by a NRCS Certified CNMP Engineer.

WY- CNMP (Comprehensive Nutrient Management Plan) CHECKLIST			
Check		Check	
	COVER #1		**COVER #2**
	Agronomy Note 19 - Checksheet		Notes and Communication
	DEQ Annual Reports CNMP Permit (Producer folder only)		WY-ECS-86 – Documentation of Producer's operation summary and objectives Manure Handling and Storage Practices, Land Treatment Practices. Nutrient Management, Recordkeeping, Feed Management. Other Utilization Options
	COVER #3		**COVER #4**
	Conservation plan maps showing location of manure application, soils maps, soils legend, soils reports.		Conservation plan, Resource Inventory, Resource Concern checklist, and Alternatives WY-ECS-60 CAFO Inventory Worksheet
	COVER #5		
	Nutrient Management Plan: Manure Production and Nutrient Balance of manure and commercial fertilizer. The Nutrient Management Plan component of a CNMP MUST be reviewed and approved by a certified CNMP Nutrient Management Planner. Use Land University Recommendations (WY-B-1045). Copy of current soil and manure analysis. Phosphorus Index (Agronomy Tech Note 15) Nitrogen Leaching Index (Ag Tech Note 25)		Herd Size, Average Animal Size, Days of Confinement, Average Manure Moisture Content, Crop Receiving Manure), Recommended Nutrients to Achieve Yield (ECS – 45A/B for manure), Nutrient Balance of Manure and Commercial Fertilizer (ECS-44). Mandatory evaluation for manure applications. (Nitrogen/Phosphorus–based Application Rate) Optional unless soil test N is >50# or >25 ppm
	COVER #6		
	Manure Handling and Storage: Divert Clean Water		If structural practices required, design criteria should include: Diversion Dike and Channel, Roof Runoff Management
	Manure Handling and Storage: Prevent Leakage: discuss potential of leakage from all retention structures and leachate from silage storage areas and possible preventative measures.		Soil Seepage/Permeability Investigations, Groundwater Analysis, and Seepage Analysis (Geologist's Report), Soil Seepage Calculations (Engineer/Geologist), Geo-technical Investigation (Technical Specialist), Soil Mechanics Test (Soil Mechanics Lab), Soil Permeability Estimates (Chapter 10D AWMFH)
	Manure Handling and Storage: Provide Adequate Storage		Design criteria should include: Design criteria should include: Normal Precipitation (NOAA), Feedlot Normal Runoff (Chapter 10 AWMFH), 25 Yr – 24 Hr. Precipitation (NOAA), 25 Yr – 24 Hr. Runoff from Feedlot (EFM – 2), Evaporation from Storage Facility (NWS), Net Storage Required, Compaction Requirements (Engineer/Geologist), Topographic Survey (Field Office), Weighted Runoff Curve Number Calculations (EFM-2), Evaporation vs. Normal Precipitation Calculations, Total Storage Requirement Calculation, State Water Permit may be required.

CNMP Components*
Address and Document in WY-ECS-86

a. Manure and Wastewater Handling and Storage – Alternatives for animal waste storage, and options for utilization of runoff from facilities. Also provide alternatives for dead animal disposal. Divert Clean Water – Siting and management practices should divert clean water from contact with feed lots and holding pens, animal manure, or manure storage systems. Clean water can include rainfall falling on roofs of facilities, run off from adjacent lands or other sources. Prevent Leakage – Construction and maintenance of buildings, collection systems, conveyance systems, and permanent and temporary storage facilities should prevent leakage of organic matter, nutrients, and pathogens to ground or surface water. Provide Adequate Storage – Liquid manure storage systems should safely store the quantity and contents of animal manure and wastewater produced, contaminated runoff from the facility, and rainfall. Dry manure, such as that produced in a typical Wyoming feedlot operation should be stored in such a way as to prevent polluted runoff. This can include dry stacking in the feeding facility or other appropriate storage locations. Location of manure storage systems should consider proximity to water bodies, floodplains, and other environmentally sensitive areas. Manure Treatments – Manure should be handled in such a way as to reduce the loss of nutrients to the atmosphere during storage and application by incorporation within 3 days of application and utilization of previous year's manure production.

Notes/Alternatives:

c. Mortality Management - Document current mortality rate and planned method of disposal. Producer must follow city, county, tribal and state rules & regulations for animal disposal. (WY Statute 35-10-104). Within 48 hours, operator may bury the animal on their property provided the following criteria are met: a minimum of two feet of cover and cannot be in contact with groundwater. Operator may haul the animal to a disposal area on their property provided it is at least ½ mile from human habitation, and cannot be in contact with surface water. Dead animals from animal operations are considered "trade wastes". Trade wastes from any industry may not be burned as a method of removal or disposal unless the operator has an air quality permit allowing them to burn trade wastes as a disposal method and the operator has a licensed incinerator in which to burn the trade waste. Animals may be taken to city landfills or rendering facility.

Notes/Alternatives:

b. Land Treatment Practices –Alternatives to control erosion and runoff from facility. May consider relocation of facility, vegetative buffers, livestock water tanks, pipelines, wells, obstruction removal, fence, temporary retention facility, waste water treatment strip, windbreaks, clean water diversion, etc. Land management practices will include a nutrient balance for crop needs, method of application rates and timing considerations.

Notes/Alternatives:

c. Nutrient Management - Nutrient Management Plan. Use WY-ECS-44 for commercial fertilizer and manure, and use WY-ECS-45a for solid manure, or WY-ECS-45b for liquid manure to determine application rates. Annual manure and soil tests are used with 5 yr- average crop yields and crop rotation. Use University of Wyoming Fertilizer Recommendation Guide B-1045 to develop crop use needs or use the recommendations from a NAPT-PAP lab. Complete a Phosphorus Index (Agronomy Note 15) and Nitrogen Leaching Index (Agronomy Note 25) prior to any manure application. WY-ECS-86.
Notes/Alternatives:
d. Record Keeping – DEQ requires an annual report to document current manure production, annual soils and manure analysis, nutrient application rates and location. DEQ provides forms for routine inspection/ monitoring.
Notes/Alternatives:
e. Feed Management- Not used in Wyoming.
Notes/Alternatives:
f. Other Utilization Activities - Alternatives for animal waste utilization; (sell/give to neighbors , composting)
Notes/Alternatives:

Planner: _____